Contribution ID: **252** Type: **Invited Lecture**

INVITED LECTURE - Solution reactors for production of Mo-99 and Sr-89 (via Kr-89)

Tuesday, 18 September 2012 16:10 (20 minutes)

Molybdenum-99 is the most important and widely used medical radionuclide which production in required quantities is possible only by fission products of Uraniun-235. In clinical practice the share of Mo-99 usage reaches approximately 80% of the total amount of radioisotope diagnostic procedures in the world. Strontium-89 is used for oncology and anesthesia and is capable of replacing painkilling drugs. Innovative technologies for production of Mo-99 and Sr-89 using solution reactors have been developed in RRC "Kurchatov Institute" . These technologies reduce the required reactor power by approximately 100 times, decrease amount of radioactive waste and are suitable for low-enriched uranium fuel in comparison with conventional production methods. The technologies have been experimentally proven and refined using 20-kW solution reactor "Argus"where the isotope samples of required quality have been produced. Mo-99 has been extracted from irradiated soluble nuclear fuel by pumping the solution though a sorption column. Accumulation of the isotope occurs during 5-day reactor operation at nominal power while the extraction is done after the reactor shutdown. Sr-89 is obtained from Kr-89 which is evaporated during reactor operation.

<p>The achieved results lead to further plans including development of Mo-99 and Sr-89 production line using 150-kW nuclear reactor.

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Session Classification: Session 5 - Nuclear fuel cycles, Research Reactors and present NPP (including Gen IV and Th reactors)

Track Classification: Nuclear fuel cycles, present Gen III+ NPPs, Gen IV and Th based reactors